Element 1: Signature Page

PRESCRIBED FIRE PLAN

ADMINISTRATIVE UNIT: Stones River National Battlefield
PRESCRIBED FIRE NAME: Stones River Prescribed Fire Plan FY14-FY18

PREPARED BY:
Name: Travis Neppl, Fuels Management Specialist, Natchez Trace Parkway
Qualification/Currency: RXB2 / Y
Signature: _____ Date: _____

TECHNICAL REVIEW BY:
Name: Shane Sturgill, Law Enforcement Ranger, Cumberland Gap NHP
Qualification/Currency: RXB2 / Y
Signature: /s/ Shane Sturgill Date: 1/26/2014

RECOMMENDED BY:
Name: Jesse Burton, Fire Ecologist, Natchez Trace Parkway
Signature: _____ Date: _____

RECOMMENDED BY:
Name: Shawn Nagle, Fire Management Officer, Natchez Trace Parkway
Signature: _____ Date: _____

RECOMMENDED BY:
Name: Troy Morris, Integrated Resources Progam Manager, Stones River NB
Signature: _____ Date: _____

RECOMMENDED BY:
Name: Gib Backlund, Chief of Operations, Stones River NB
Signature: _____ Date: _____

COMPLEXITY RATING: MODERATE
MINIMUM BURN BOSS QUALIFICATION: RXB2

APPROVED BY:

Name – Agency Administrator: Gayle Hazelwood, Superintendent, STRI

Signature – Agency Administrator: _____ Date: _____

Delegation of Authority:

The approved prescribed fire plan constitutes a delegation of authority to burn. No one has the authority to burn without an approved plan or in a manner not in compliance with the approved plan. Actions taken in compliance with the approved prescribed fire plan will be fully supported. Personnel will be held accountable for actions taken that are not in compliance with elements of the approved plan regarding execution in a safe and cost-effective manner.

INSERT PMS 485

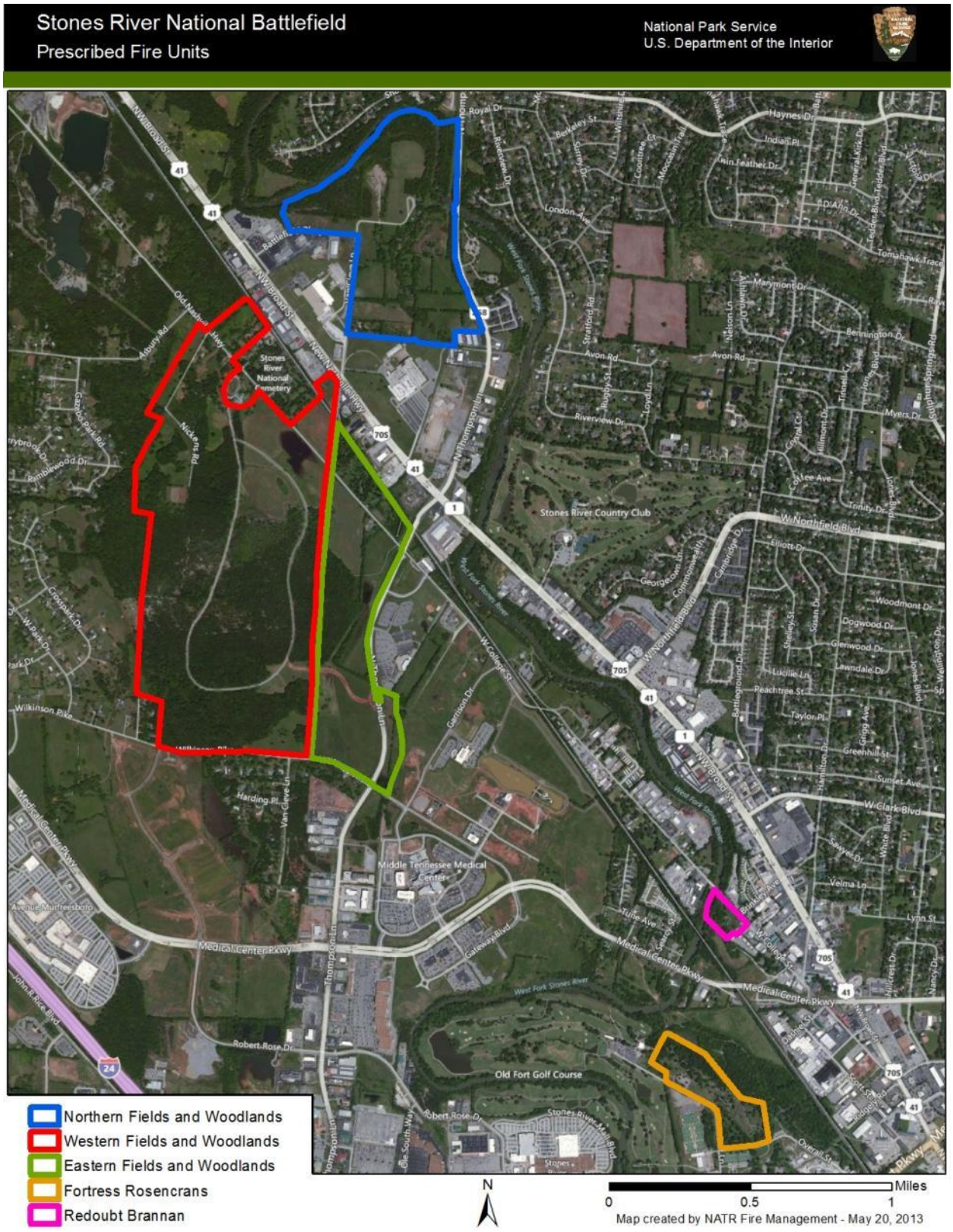
INSERT PMS 486

Element 3: Complexity Analysis Summary

PRESCRIBED FIRE NAME			
ELEMENT	**RISK**	**POTENTIAL CONSEQUENCE**	**TECHNICAL DIFFICULTY**
1. Potential for escape	L	L	L
2. The number and dependence of activities	M	M	L
3. Off-site Values	M	M	M
4 On-Site Values	M	M	M
5. Fire Behavior	M	M	M
6. Management organization	M	M	M
7. Public and political interest	M	M	L
8. Fire Treatment objectives	M	M	M
9 Constraints	M	M	M
10 Safety	M	L	M
11. Ignition procedures/ methods	L	M	M
12. Interagency coordination	M	M	M
13. Project logistics	L	M	M
14 Smoke management	M	M	M

COMPLEXITY RATING SUMMARY	
	OVERALL RATING
RISK	M
CONSEQUENCES	M
TECHNICAL DIFFICULTY	M
SUMMARY COMPLEXITY DETERMINATION	M
RATIONALE: This burn plan is rated at a moderate complexity level due to smoke management concerns in the urban interface as well as impacts to motorists on local roadways. The smoke management information included in Elements 7, 9, 13, 17, and 19 outline the measures that will be taken to safely implement prescribed fires while providing for the safety of fire personnel, park visitors, and the local public.	

Element 4: Description of the Prescribed Fire Area



Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

A. Physical Description

1. Location**:** Rutherford County , Tennessee

Unit Name	Lat / Long and UTM	Ignition Unit Name	Acres
Northern Fields and Woodlands	N35°53'31" W86°25'33" 551789E 3972115N Z16	McFadden Farm Forest	31.7
		TNC Tract	6.6
		Drive In Theater	6.4
		King Fields	36.3
		Vaughter Fields	32.3
		Smith Fields	17.9
		Unit Acres	**131.3**
Western Fields and Woodlands	N35°52'20" W86°26'09" 551069E 3970207N Z16	Unicorn Tract	2.8
		Garesche Field	8.2
		Visitor Center Field	12.9
		Lake Garesche	11.3
		Interior Loop Fields	16.9
		Western NPU Forest Complex	50.9
		Interior Loop Woodlands	72.2
		West Van Cleve Woodlands	19.8
		Southwestern Woodlands	69.3
		Hugle Bell Harding Tract	8.5
		Beasley Tract	7.3
		Chicago Board of Trade	5.4
		Jackson Woods Tract	14.9
		Taylor West Tract	23.8
		Michigan Marker	6.1
		Wilkinson Pike	10.0
		Unit Acres	**340.2**
Eastern Fields and Woodlands	N35°52'04" W86°25'49" 551522E 3969775N Z16	Round Forest	9.6
		Harlan Bigsby	3.4
		East Van Cleve Woodlands	16.4
		Miller Blansett Gannon Tract	53.4
		Miller Addition	7.6
		Toll House Tract	14.5
		Unit Acres	**104.8**
Redoubt Brannan	N35°51'33" W86°24'36" 553261E 3968489N Z16	**Unit Acres**	**5.3**
Fortress Rosencrans	N35°51'07" W86°24'39" 553196E 3967714N Z16	**Unit Acres**	**27.7**
Total Acres			**609.3**

2. Topography:

Unit Name	Elevation(ft)	Slope(%)	Aspect
Northern Fields and Woodlands	540 – 560	0-3, Avg. 3	Flat
Western Fields and Woodlands	550 - 580	0-3, Avg. 3	Flat
Eastern Fields and Woodlands	560 - 570	0-3, Avg. 3	Flat
Redoubt Brannan	540 – 590	0-20, Avg 5	West
Fortress Rosencrans	570 – 590	0-3, Avg 3	All

3. Project Boundary:

Unit Name	Northern Boundary	Eastern Boundary	Southern Boundary	Western Boundary
Northern Fields and Woodlands	West Fork Stones River	North Thompson Lane	Mow Line along STRI Boundary	Van Cleve Lane / Mow Line
Western Fields and Woodlands	Mow Line / Old Nashville Hwy / Broad Street	Van Cleve Lane	Wilkinson Pike	Fire Line along STRI Boundary
Eastern Fields and Woodlands	CSX Railroad Right of Way	N Thompson Lane	Wilkinson Pike	Van Cleve Lane
Redoubt Brannan	College Street	Parking Lot / Fire Line	Fire Line	West Fork Stones River
Fortress Rosencrans	Stones River Greenway / Fireline	Lytle Creek	Overall Street and Golf Lane	Stones River Greenway

The table above lists the project boundaries for each burn unit. The units may be burned as a whole, or divided into sub-units (ignition units). Sub-unit boundaries may include roads, trails, mowed fire line, leaf blower line, and natural barriers. The sub-unit boundaries that have been used in the past are included in Table A above, and are shown in the project maps in Appendix A.

B. Vegetation/Fuels Description:

1. On-site fuels data:

Grasslands (GR3, GR6)

The grassland units include a mixture of native and exotic grasses and forbs. Dominant species in most of the grassland units include bluestem, Indiangrass, broomsedge, purpletop, beaked panic grass, goldenrod, ironweed, and frostweed species. In wetter areas, sedge and rush species are present. Exotic species present may include sericea lespedeza, Japanese honeysuckle, Johnsongrass, and foxtail species. Exotic fescue, which is green during winter months, may underlay native grasses and forbs. Although the vegetation is mostly continuous, some grassland units contain bare areas where exotics have been treated and where limestone bedrock is exposed. Scattered tree species, such as oaks, eastern redcedar, and hackberry, may occur within grassland units. The historic fire regime would have included a return interval of approximately 1-3 years, with mixed seasonality.

GR3 - Dominated by grass fuels shorter than 3' average height.
GR6 - Dominated by grass fuels taller than 3' average height. This fuel model will be used to represent grass fuels in fire modeling runs.

Cedar Glades and Barrens (TL1, TU2, TU3)

The interior woodlands of the park ranges from dense eastern redcedar stands with minimal herbaceous vegetation, to the more open Central Tennessee Basin glades and barrens dominated by perennial grasses and forbs. Dominant understory species in the Barrens include bluestems, broomsedge, dropseed, and gramma grasses. Grassy areas are interspersed with open areas of rock/lichens and sparse herbaceous cover, including the endangered limestone glade milkvetch and recently delisted Tennessee purple coneflower. Exotic species include sericea lespedeza, bush honeysuckle, and sweetclover. While still important in maintaining species diversity on the glades, limited fuels and abundant exposed rock would have reduced the frequency of fires occurring on the surrounding grasslands.

TL1 - Dominated by eastern red-cedars with no herbaceous component
TU2 - Dominated by eastern red-cedars with very low herbaceous component
TU3 - Barrens with 50% or greater herbaceous component. This fuel model will be used to represent cedar glades and barrens in fire modeling runs.

Mixed Hardwood (TL2, TL6)

Units in this fuel model are characterized by an overstory of mixed hardwoods (oaks, hickories, winged elm, hackberry, ashes, sugar maple) and eastern redcedar. Understory species vary, and may include native privet, aromatic sumac, rusty blackhaw, coralberry, bluestem, purpletop, rosette grass, and goldenrod, species. Exotic species are similar to those listed for Barrens. The historic fire interval would have been less than 15 years.

TL2 - Fields or cleared sites that have grown up in early successional woody vegetation.
TL6 - Established hardwood forest with adequate litter for carrying fire. This fuel model will be used to represent hardwood forest in fire modeling runs.

2. Adjacent fuels data

Mixed Hardwood (TL6)

Fuels outside of the STRI boundary include mowed grass, non-burnable developed areas, and mixed hardwood timber. The hardwood timber will be modeled as a TL6 for the purposes of determining

adequate holding resources. See Appendix E and F for fire modeling runs and the Adequate Holding Resource Worksheet.

3. Percent of vegetative type and fuel models:

The following table lists percent composition of fuel models based on visual estimates.

Unit Name	Percent Composition (%)	Fuel Model	Total Fuel Load <3-inch, dead and live (tons/acre)	Dead Fuel Load, 0-¼-inch (tons/acre)	Live Fuel Load (tons/acre)	Fuel Bed Depth (ft.)
Northern Fields and Woodlands	40	TL6	4.8	2.4	0.0	0.3
	20	GR3	2.0	.10	1.5	2.0
	40	GR6	3.5	.10	3.4	1.5
Western Fields and Woodlands	30	TL1	6.8	1.0	0.0	0.2
	15	TL6	4.8	2.4	0.0	0.3
	15	TU2	4.2	.95	.20	1.0
	5	TU3	3.25	1.1	1.75	1.3
	15	GR3	2.0	.10	1.5	2.0
	10	GR6	3.5	.10	3.4	1.5
Eastern Fields and Woodlands	20	TL1	6.8	1.0	0.0	0.2
	5	TU2	4.2	.95	.20	1.0
	40	GR3	2.0	.10	1.5	2.0
	35	GR6	3.5	.10	3.4	1.5
Redoubt Brannan	40	GR3	2.0	.10	1.5	2.0
	60	TL6	4.8	2.4	0.0	0.3
Fortress Rosencrans	100	TL6	4.8	2.4	0.0	0.3

Scott, Joe H. and Burgan, Robert E. 2005. Standard Fire Behavior Fuel Models: A Coomprehensive Set for Use with Rothermel's Surface Fire Spread Model. GTR, RMRS-GTR-153 Rocky Mountain Research Station

C. Description of Unique Features, Natural Resources, Values:

Cultural resources are found throughout the park including historic structures at Fortress Rosecrans and household dumps at former house sites. As per National Park Service guidelines, any ground disturbing equipment such as dozers/tractor plows will not be used on NPS owned lands. All required prep work should be readily accomplished with common hand tools and equipment, without causing sub-surface ground disturbance.

The endangered Indiana bat is a species of particular concern throughout the state of Tennessee and National Park Service staff will implement certain strategies to help minimize or eliminate the potential for disturbance on this species. Prescribed fires will typically be implemented prior to March 31 in order to reduce potential impacts to roosting bats. Any burning conducted after April 1 will require prior concurrence from the US Fish and Wildlife Service. NPS staff will also work to minimize disturbance to trees of potential occupation by this species. Of particular concern are tree species with "shaggy" bark, such as shag-bark hickory (*Carya ovata*), and greater than 5 inches in diameter at breast height. During preparations for prescribed fire operations, staff will be educated and instructed to not cut down and to rake surface fuels away from individual trees/snags where practical. In situations where snags threaten life, property, or fire containment lines individual trees will be thoroughly evaluated before being removed. Prescribed fires will be utilized by National Park Service staff to benefit Indiana bat by providing improved "clutter-free" roosting and foraging habitat, additional snags, increasing prey availability, and maintaining dominance of oaks and hickory species needed in this area (Dickinson et al. 2009). Without prescribed fire, species such as white oak (*Quercus alba*), shagbark hickory (*Carya ovata*), and shellbark hickory (*C. laciniosa*) will continue to decline in density and be replaced by shade tolerant species such as red maple (*Acer rubrum*), beech (*Fagus grandiflolia*), water oak (*Q. nigra*), sourwood (*Oxydendrum arboreum*), and sweetgum (*Liquidambar styraciflua*), all less desirable species for roosting Indiana bat (USFWS 2007, USFWS 2007, USFS 2006).

Prescribed fire will also be utilized to improve habitat for the endangered limestone glade milkvetch or Pyne's ground-plum (*Astragalus bibullatus*). This shade intolerant species thrives only in the glade and barren habitat provided by frequent to infrequent fires burning in edaphic limestone outcrops. A species reintroduction program in ongoing within the Western Fields & Woodlands fire management unit. The fire ecologist and burn boss with work with local park resource staff and/or contracted botanist to mitigate any undesirable impacts to cultivated species by fire management activities. Long-term, the species is expected to thrive under conditions provided by prescribed fire.

Unit Name	Unique Feature	Mitigation Measures
All Units	Indiana Bat Habitat	Where possible, clear brush and surface fuels a minimum of 6' around the base of snags that are potential habitat trees.
Western Fields & Woodlands	Pyne's Ground-plum	Minimize disturbance to reintroduction plantings, including exclusion cages, tags, and other identifiers. Until species have been determined to be fully established, limit fire within plantings when individuals are still "green".

D. Maps: See Appendix A for Vicinity, Smoke, and Project Maps

Element 5: Objectives

A. Resource and Fire Management Objectives:

Direction to utilize prescribed fire to achieve goals and objectives further stated in this burn plan comes from the Battlefield's Resource Management and Fire Management Plans. Prescribed fire will help decrease risk of damaging wildfires, and will help perpetuate the natural and cultural resource values for which the Stones River National Battlefield was established.

Resource and Fire Management Objectives for Grassland (GR6) Units:

- Reduce cover of exotic species by 20-75% by 5 years postburn
- Increase native herbaceous species cover and diversity by 20-50 by 5 years postburn

Resource and Fire Management Objectives for Cedar Glades and Barrens Units:

- Reduce cover of eastern redcedar and exotic species by 20-75% by 5 years postburn
- increase native herbaceous species cover and diversity by 20-75% by 5 years postburn

Resource and Fire Management Objectives for Mixed Hardwood (TL6) Units:

- Reduce litter and duff by >30% immediately post-burn
- Induce mortality in exotic species by >30% over 5 years post-burn.
- Increase native herbaceous species cover and diversity by >20% over 5 years post-burn.

Element 6: Funding

A. Cost:

The project costs associated with the planning and implementation of prescribed fires at Stones River National Battlefield historically average approximately $90.00 per acre.

B. Funding source:

An annual funding request will be generated to cover implementation of the following year's treatment efforts. This request will be processed through the National Fire Plan Operations and Reporting System (NFPORS), as wildland urban interface hazard fuels treatments. Once approved, account numbers will be established by the Southeast Regional Office and made available to park and fire use personnel for implementation. Costs associated with these treatments will be tracked and excess funds returned to the SERO for re-distribution as required.

Element 7: Prescription

A. Prescription Narrative:

This burn plan includes numerous burn units and sub-units containing a wide variety of fuel and environmental conditions. The following prescription was written to allow a wide range of weather conditions in order to meet the objectives of each burn unit. It is the responsibility of the Burn Boss to evaluate all forecasted weather conditions, both individually and as a whole, in determining whether or not conditions will be favorable for meeting burn objectives. It is also the responsibility of the Burn Boss to determine if burn resources will be adequate based on the weather forecast and expected fire behavior.

B. Prescription Parameters

1. Environmental Parameters:

	Weather	Acceptable Range	Optimal
1	Temperature (°F)	30 – 95	60
2	Relative Humidity (%)	20 – 60	30
3	Wind Direction		
	Northern Fields and Woodlands	Any	SE
	Western Fields and Woodlands	Any	S – SE
	Eastern Fields and Woodlands	Any	SE
	Redoubt Brannan	NW, N, NE, E, SE	E
	Fortress Rosencrans	SE, S, SW	SE
4	1 Hour Fuel Moisture (%)	5 – 12	6
5	Mid-flame Wind Speed (mph)	0 – 8	4
6	Mixing Height (meters) and Transport Wind Speed (m/s)	≥890 meters and 3.0 m/s OR ≥500 meters and 3.5 m/s	
7	Drought Indicator – KBDI	<600	300

2. Fire Behavior Parameters:
   - Grass Fuels

Fuel Characteristics		Acceptable Range
GR6	Rate of Spread (Chains/hour)	11 – 246
	Flame Length (feet)	5 – 24
	Probability of Ignition (%)	24 – 67

- Mixed Hardwoods

Fuel Characteristics		Acceptable Range
TL6	Rate of Spread (Chains/hour)	1 – 13
	Flame Length (feet)	0.5 – 4
	Probability of Ignition (%)	24 – 67

- Cedar Glades and Barrens

Fuel Characteristics		Acceptable Range
TU3	Rate of Spread (Chains/hour)	1 – 36
	Flame Length (feet)	1 – 10
	Probability of Ignition (%)	24 – 67

Element 8: Scheduling

A. Implementation Schedule:

1. Ignition Time Frames/Season(s):
   - Prescribed fires will typically be implemented prior to March 31 in order to reduce potential impacts to roosting bats. Any burning conducted after April 1 will require prior concurrence from the US Fish and Wildlife Service.
   - There is no set treatment schedule. The units treated each year will be determined by the network Fire Ecologist and/or STRI Integrated Resource Manager based on current fuel conditions and unit objectives.

B. Projected Duration:

- 1-2 days per unit
- Smoke and flames may persist for several days

C. Constraints:

Please refer to Element 7 for the acceptable weather and smoke dispersion parameters.

At Planning Level 4 or 5, approval from the NPS Southeast Region Fire Management Office is required prior to implementing a prescribed fire. To request approval the following documents must be submitted to the SER Fire Management Office:

1. A short justification memorandum from the Superintendent to the Regional Director that explains the special circumstance that exists which warrants consideration for implementing a prescribed fire.
2. A completed and signed "*Agency Administrator Pre-Ignition Approval Checklist"*
3. A copy of the *Seasonal Risk Analysis* data as described on page 10-6 of the Interagency Standards for Fire and Fire Aviation Operations (Red Book). The same data is used on severity requests and can easily be modified to fit this requirement. Labor and cost information is not required.

Element 9: Pre-burn Considerations and Weather

A. Considerations:

1. On Site:
   - The Burn Boss or designee will determine the actual specifications for constructed fire line, prep needs for structures and improvements, snags to be felled or pre-treated, and equipment to be pre-positioned prior to ignition.
   - The Burn Boss or designee will ensure that all snags and trees with "cat-faces" with the potential to catch fire and fall across fire control lines or onto structures or improvements be felled or pre-treated (preferred) prior to ignition. The minimum recommended pre-treatment is to clear all brush and litter fuels within 6' of the base of the tree.
   - Project Maps - The maps included in Appendix A were designed to help reference burn unit boundaries as outlined in this plan. These maps may be altered as needed for prescribed fire operations. The Burn Boss or designee will develop a Project Map which will be included in the Incident Action Plan on the day of the burn. If drop points will be used, the Burn Boss or designee will ensure that all drop points shown on the Project Map are flagged prior to ignition. Drop point flagging will remain in place until the Burn Boss determines that they may be removed.
   - Traffic Warning Signs - The Burn Boss or designee will ensure that traffic and smoke warning signs are placed on local roadways prior to ignition to alert motorists of the prescribed fire in progress and the potential for smoke along the roadway. The Burn Boss or designee will determine the exact sign locations based upon the local road conditions and the expected smoke dispersion on the day of the burn.

2. Off Site
   - IAPs
     - The Burn Boss or designee will complete an Incident Action Plan for each operational shift of the burn. This Incident Action Plan will include at the minimum:
       1. Incident Objectives (ICS-202)
       2. Division Assignments (ICS-204)
       3. Medical Plan (ICS-206)
       4. Project Map
       5. Weather Forecast
     - Radio frequencies will be included in the Division Assignments (ICS-204). A Communication Plan (ICS – 205) is not required, but may be included at the discretion of the Burn Boss.
     - The spot weather forecast is not required in the Incident Action Plan, but must be discussed with all burn personnel at the project briefing.
   - Burn Permits
     - The Burn Boss or designee will contact the Tennessee Forestry Commission to request a burn permit prior to ignition. A burn permit must be obtained for each operational shift where ignition will occur. Refer to the notification section below for contact information.
   - Delegations of Authority
     - A signed copy of this burn plan will serve as a Delegation of Authority for all NPS Burn Bosses and must be on-site on the day of the burn.
     - A separate Delegation of Authority must be signed by the Agency Administrator for non-NPS Burn Bosses.

B. Method and Frequency for Obtaining Weather and Smoke Management Forecast(s):

- The Burn Boss or designee will obtain a spot weather forecast from the National Weather Service prior to ignition, and on all subsequent days until the Burn Boss determines that there are no threats to unit boundaries.

- The Burn Boss or designee in charge of mop-up and patrol will also obtain and review the spot weather forecast to determine if mop up and patrol resources are adequate.
- During the burn on-site weather, fire, and smoke observations will be documented by a Fire Effects Monitor (FEMO). The Burn Boss will determine the frequency for collecting observations based on the on-site conditions. The FEMO will broadcast current weather observations to burn personnel at intervals determined by Burn Boss or designee. On-site weather observations will be used when requesting spot weather forecasts.

C. Notifications:

- The Murfreesboro Airport will be contacted prior to ignition and on burn day for weather information and to advise pilots of the potential for smoke on the approach to the Airport.
- Press releases may be issued for individual burn units at the discretion of the Burn Boss, or under the direction of the STRI Superintendent, Chief of Operations, or Integrated Resource Program Manager.
- Please refer to Appendix I for the Required Notification list.

Element 10: Briefing

At a minimum, assigned personnel must be briefed at the beginning of each operational period to ensure personnel safety considerations (including the JHA) and prescribed fire objectives and operations are clearly defined and understood. The following briefing checklist will serve as a guide while conducting briefings:

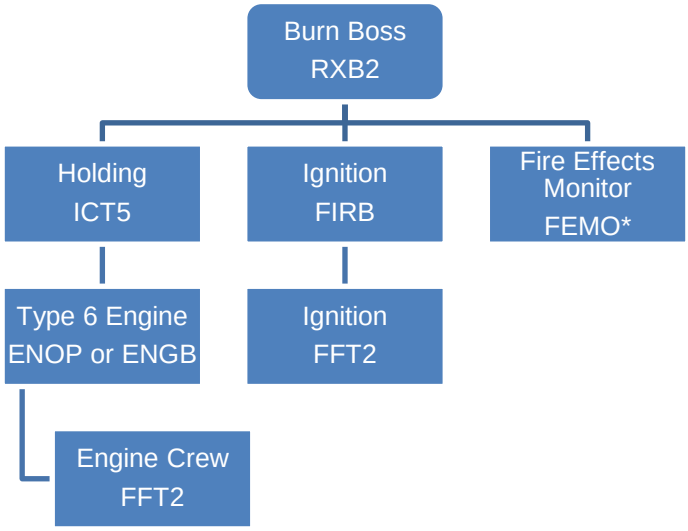
A. Briefing Checklist:

- ☐ Burn organization and assignments
- ☐ Prescribed fire objectives and prescriptions
- ☐ Description of prescribed fire area
    - Special considerations and sensitive features
- ☐ Expected weather and fire behavior
- ☐ Communications
- ☐ Ignition plan
- ☐ Holding Plan
- ☐ Contingency plan and assignments
- ☐ Wildfire declaration
- ☐ Safety and medical plan

Element 11: Organization and Equipment

The organizational table below represents the **minimum** type and number of resources needed during prescribed fire operations. The Burn Boss is ultimately responsible for evaluating the burn unit and determining the resources required during each phase of the burn. Resource production rates must be adequate for the expected conditions as outlined in the Holding Resources Worksheet in Appendix F. The use of trainees in any position is encouraged as long as individuals meet the minimum qualifications for the position as outlined in the Wildland Fire Qualifications Guide (PMS310-1). Each trainee must have a qualified trainer assigned to that position. A copy of the organizational chart will be included in the Incident Action Plan for each operational shift during the burn.

A. Positions:



* FEMO may be assigned as a collateral duty position.

B. Equipment:

Two Type 6 Engines are required on-site during the burn. One Type 6 Engine may be staged on-site and remain unstaffed during the burn. It is required on-site in the event that the primary Type 6 becomes inoperable or in the event that both engines are needed for holding operations. If used, it must be staffed by a qualified ENOP or ENGB and one FFT2.

ATVs and UTVs are allowed during the burn provided that they are assigned to a fully qualified operator (ATVO).

C. Supplies:

All standard prescribed fire and wildland fire supplies may be used during burn operations, including but not limited to hand tools, drip torches, drip torch mix, and bladder bags.

Element 12: Communication

A. Radio Frequencies

1. Command Frequency:

Channel Name	Function	RX	TX
STRI Tac	Scene of Action/ Tactical	172.775	172.775

2. Tactical Frequencies:

Channel Name	Function	RX	TX
STRI Tac	Scene of Action/ Tactical	172.775	172.775
NATR Tac 2	Scene of Action/ Tactical	168.200	168.200

3. Air Operations Frequency:

Channel Name	Function	RX	TX
Air to Ground	Air to Ground	169.200	169.200

B. Telephone Numbers:

Please see Appendix I for the list of required notifications for the burn, including contact information for obtaining a burn permit and spot weather forecast.

An additional contact list has been included in Appendix J for reference, but does not include any required notifications.

Element 13: Public and Personnel Safety, Medical

A. Safety Hazards:
Please refer to the prescribed fire Job Hazard Analysis in Appendix D for specific safety hazards and the appropriate mitigation measures.

B. Mitigation: Measures Taken to Reduce Hazards:
All burn personnel will wear standard wildland firefighting personal protective equipment.

The Burn Boss or designee will ensure that smoke warning signs are placed on local roadways prior to ignition. The exact location of the signs will be determined by the Burn Boss on the day of the burn. The Burn Boss is responsible for ensuring that smoke emissions and roadway visibility are monitored throughout the burn. Additional smoke warning signs may be placed on local roads at the discretion of the Burn Boss. See Elements 7, 9, 13, 17 and 19 for more information regarding smoke management and mitigation measures.

The Burn Boss or designee will conduct a daily safety and project briefing prior to work for each operational shift of the project. The Burn Boss or designee will complete an IAP prior to each operational period that will address objectives, fire weather/behavior, assignments, communications, and safety hazards, and a medical plan. All personnel involved in the project must attend the briefing or receive a briefing from the Burn Boss prior to assisting with burn operations. The prescribed fire Job Hazard Analysis included in Appendix D will be available on-site at all burns.

It is the responsibility of all burn personnel to inform their supervisor of any safety hazards observed during the prescribed fire. The Burn Boss will work with the appropriate supervisors to institute any corrective safety measures associated with this project. If a safety issue cannot be resolved prior to ignition of any portion of this project, ignition will not take place. If the issue occurs during the course of operations, it will be mitigated with the most reasonable measures possible that will provide for safety of public and employees. If necessary, the project will be shut down until the mitigation efforts are successful.

C. Emergency Medical Procedures:
Please refer to Appendix G for the sample Medical Plan. An updated copy of the Medical Plan will be included in the Incident Action Plan for all operational shifts. In the event of an injury, the injured party or the first person to arrive at the scene of the injured party will contact the Burn Boss via radio to alert them of the medical situation. The nearest medically trained person (e.g. EMT, WFR, First-Aid) will assess the patient and begin to provide care. Any injury requiring more than First-Aid will be managed as a separate medical incident. The following steps will be taken:

- The Burn Boss will assign a Medical Incident Commander to manage the medical incident.
- The person with the highest medical qualification will be assigned as the Medic for the incident. The Medic will determine whether advanced care is required, and what type of advanced care is needed (e.g. transportation by burn personnel to a clinic or hospital, ordering an ambulance, ordering a Life Flight).
- The Medical Incident Commander or designee will arrange transportation to advanced care. Transport may be arranged by calling 911, or using the contact information in the Medical Plan.

D. Emergency Evacuation Methods:

The Medical Incident Commander or designee will arrange transportation to advanced care. Transport may be arranged by calling 911 or using the contact information in the Medical Plan. A copy of the Medical Plan will be included in the Incident Action Plan for all operational shifts.

E. Emergency facilities:

Emergency facilities and contact information will be identified in the Medical Plan, which will be included in the Incident Action Plan for all operational shifts.

Element 14: Test Fire

A. Planned location:

The Burn Boss will conduct a test fire as part of the go / no-go burn decision process. The Burn Boss will determine where to conduct the test fire, and how many resources must be present at the test fire. The test fire will be ignited in an area with fuels that are representative of fuels being targeted within the treatment unit. The purpose of the test fire is to observe fire behavior and attempt to determine if the expected fire behavior based on fuels, topography, and forecasted weather conditions, will be favorable for meeting burn objectives. Results of the test fire will be documented by the Burn Boss and Firing Boss and retained as part of the Prescribed Fire Record (Fire Report).

B. Test Fire Documentation:

1. Weather conditions on site:

   Weather conditions will be documented by the FEMO and included in the prescribed fire project file.

2. Test fire results:

   Please refer to Appendix H for the test fire documentation form. The completed form will be included in the prescribed fire project file.

Element 15: Ignition Plan

A. Firing Methods:

1. Techniques, sequences, and patterns:

   Ignition will begin by building a blackline along containment lines. Interior ignition may begin once the blackline has been established. Ignition may produce head, backing, or flanking fire as long as burn objectives are being met and the fire behavior is within prescription parameters. The FEMO will document fire behavior and inform the Firing Boss of the observed fire behavior. The Firing Boss is responsible for adjusting firing tactics as needed to meet burn objectives.

B. Devices:

Any common ignition device may be used, including drip torches, fusees, and PSD launchers.

C. Minimum Ignition Staffing:

The Burn Boss and FIRB will determine the required ignition staffing based on the unit objectives, the forecasted weather, and the expected fire behavior.

Element 16: Holding Plan

As directed by the Interagency Prescribed Fire Planning and Implementation Procedures Guide, holding operations will be managed by a "Holding Specialist" qualified at the appropriate Incident Command System wildland fire operations standard. For smaller burn organizations involving holding resources of a single type, an Incident Commander Type 5 may be utilized. For larger burn operations involving varied types of resources, an Incident Commander Type 4 or Task Force Leader is required. It is the responsibility of the Burn Boss to evaluate each burn unit to determine the resources required, as well as the appropriate qualifications necessary to safely implement the burn.

A. General Procedures for Holding:

Holding resources may include engines, water tenders, hand crews or squads, and specialized equipment such as UTVs and ATVs with water tanks. Holding resources will work to ensure that the prescribed burn is contained within the targeted area and to protect infrastructure, private property, cultural sites, research equipment, and other values at risk. Known values at risk and water sources will be identified on the project map and discussed during the pre-burn briefing. Several units contain interior roads, trails, fireline, mowed lines and creeks that may be used as holding lines if it becomes necessary to terminate the burn.

Mop-up of all or part of the unit will occur if the Burn Boss or Fire Management Officer determines there is potential risk of escape or if needed to reduce smoke emissions. Personnel will remain on the fire until the burn boss determines it safe to leave, after which regular patrols will be instituted until the burn is declared out.

The Holding Specialist will supervise and direct suppression efforts for any spot fires or slop-overs that occur. If the complexity of the suppression operation exceeds the qualifications of the Holding Specialist, an Incident Commander at the appropriate qualification level will be assigned to lead suppression efforts.

B. Critical Holding Points and Actions:

The Burn Boss and Holding Specialist will evaluate critical holding areas and the required mitigation strategies prior to ignition. Critical holding areas and mitigation will be discussed at the pre-burn operational briefing.

C. Minimum Organization or Capabilities Needed:

Refer to Holding Resources Worksheet (Appendix F).

Element 17: Contingency Plan

This contingency plan identifies the Management Action Points that indicate when additional actions are needed, the actions to be taken, the resources necessary to implement the actions, the resources responsible, and the consequences of inaction.

A. Management Action Points or Limits:

Designator and Description: Prescribed fire objectives (element 5)
Condition: Burn objectives are not being met due to undesired fire behavior.
Management Intent: Alter firing tactics or patterns to improve burning conditions.
Recommended Action to Consider:

A. If fire behavior is not sufficient to meet burn objectives, alter firing tactics or patterns in order to increase fire intensities.
B. If fire behavior is too intense for meeting burn objectives, alter firing patterns in order to decrease fire intensities.
C. If adjusting firing tactics and patterns is unsuccessful due to current weather conditions, but conditions are expected to improve later in the operational shift, postpone the burn until conditions improve.
D. If adjusting firing tactics and patterns is unsuccessful due to current weather conditions and weather conditions are not expected to improve, terminate the burn.

Recommended Resources:

A. FEMO, FIRB, Ignition personnel
B. FEMO, FIRB, Ignition personnel
C. Burn Boss
D. Burn Boss

Time Frame:

A. Immediately
B. Immediately
C. Immediately
D. Immediately

Describe the consequences of not taking the recommended actions:

A. The burn will be completed, but fire behavior will be insufficient for meeting burn objectives.
B. The burn will be completed, but fire behavior will be too intense and could result in undesirable resource damage.
C. If ignition continues before weather conditions improve, burn objectives will not be met as described in A and B.
D. If ignition continues and the burn is completed under unfavorable conditions, burn objectives will not be met as described in A and B.

Responsibility:

A. The FEMO is responsible for notifying the FIRB of the need to alter tactics to meet objectives. The FIRB is responsible for adjusting tactics and patterns to improve burning conditions.
B. The FEMO is responsible for notifying the FIRB of the need to alter tactics to meet objectives. The FIRB is responsible for adjusting tactics and patterns to improve burning conditions.
C. Burn Boss
D. Burn Boss

Date Each Action is Initiated:

A. _____
B. _____
C. _____
D. _____

Designator and Description: Smoke impacts
Condition: Smoke on local roadways results in potentially unsafe driving conditions.
Management Intent: Reduce smoke impacts to roadways by altering firing tactics, postponing ignition, terminating the burn, and/or implementing traffic control.
Recommended Action to Consider:

A. If fire intensity is inadequate for creating vertical lift of the smoke column, adjust firing tactics and patterns to produce higher intensity fire with the intent of influencing the smoke to lift.
B. If smoke impacts are due to unfavorable winds and weather conditions are expected to improve later in the operational period, postpone ignition until wind conditions become favorable.
C. If smoke impacts are expected to be of short duration and traffic control can mitigate safety concerns without compromising the safety of traffic control personnel or motorists, implement traffic control to slow motorists or stop traffic until conditions improve.
D. If smoke impacts cannot be mitigated or conditions are not expected to improve, terminate the burn and implement traffic control to slow motorists or stop traffic until conditions improve.

Recommended Resources:

A. Burn Boss, Firing Boss, ignition personnel
B. Burn Boss, Firing Boss, ignition personnel
C. Burn Boss, Law Enforcement
D. Burn Boss, Law Enforcement

Time Frame:

A. Immediately
B. Immediately
C. Immediately
D. Immediately

Describe the consequences of not taking the recommended actions:

A. Continued smoke impacts could result in vehicle accidents and injuries to the public and burn personnel.
B. Continued smoke impacts could result in vehicle accidents and injuries to the public and burn personnel.
C. Continued smoke impacts could result in vehicle accidents and injuries to the public and burn personnel.
D. Continued smoke impacts could result in vehicle accidents and injuries to the public and burn personnel.

Responsibility:

A. The Burn Boss is responsible for determining if smoke impacts warrant the need to alter ignition tactics. The Firing Boss is responsible for altering firing tactics and patterns to favorably influence fire behavior.
B. The Burn Boss is responsible for making the decision to postpone ignition, and to make the decision to resume ignition once conditions improve.
C. The Burn Boss is responsible for requesting traffic control through STRI Law Enforcement. STRI Law Enforcement will be responsible for making the determination of whether to implement traffic control or request a road closure.
D. The Burn Boss is responsible for making the decision to terminate the burn, and for requesting traffic control through STRI Law Enforcement.

Date Each Action is Initiated:

A. _____
B. _____
C. _____
D. _____

Designator and Description: Prescription parameters exceeded
Condition: On-site weather or fire conditions fall outside of allowable limits during the burn.
Management Intent: Select the safest course of action to either finish the burn, postpone ignition until conditions improve, or terminate the burn.
Recommended Action to Consider:

A. If the burn can be safely held using interior fire lines or natural barriers and conditions are expected to return to allowable limits, ignition will be postponed until conditions improve.
B. If the burn can be safely held using interior fire lines or natural barriers but conditions are not expected to return to allowable limits as outlined in the prescription, then the burn will be terminated.
C. If the burn cannot be safely held using interior fire lines or natural barriers, and completing the burn will not result in undesirable fire effects (i.e. undesired levels of vegetative mortality), ignition may proceed until the unit is completed.
D. If the burn cannot be safely held using interior fire lines or natural barriers and completing the unit will result in undesirable fire effects, and the burn can be extinguished without compromising firefighter safety, then the burn will be terminated and the appropriate suppression tactic will be used.
E. If the burn cannot be safely held using interior fire lines or natural barriers and completing the unit will result in undesirable fire effects, but the burn cannot be safely extinguished without compromising firefighter safety, then ignition may proceed until the unit is completed.

Recommended Resources:

A. Burn Boss, FEMO, Firing Boss, ignition personnel
B. Burn Boss, FEMO, Firing Boss, Holding Specialist
C. Burn Boss, FEMO, Firing Boss, ignition personnel
D. Burn Boss, FEMO, Holding Specialist, holding personnel
E. Burn Boss, FEMO, Firing Boss, ignition personnel

Time Frame:

A. The burn will be secured, and postponed until conditions return to allowable limits.
B. Immediately
C. The burn will continue until it is completed.
D. Immediately
E. The burn will continue until it is completed.

Describe the consequences of not taking the recommended actions:

A. Burn objectives may not be met, and the potential for long-term resource damage exists.
B. Burn objectives may not be met, and the potential for long-term resource damage exists.
C. Burn objectives may not be met, and the potential for long-term resource damage exists.
D. Burn objectives may not be met, and the potential for long-term resource damage exists.
E. Burn objectives may not be met, and attempting to suppress the fire could result in firefighter injury.

Responsibility:

A. The FEMO is responsible for notifying the Burn Boss once the burn is out of prescription. The Burn Boss is responsible for determining is the burn can be safely held until conditions improve. The Firing Boss and ignition personnel will secure the fire along interior fire lines or natural barriers as needed.
B. The Burn Boss is responsible for determining if conditions may improve later in the operational shift, and for making the decision to terminate the burn.
C. The Burn Boss is responsible for determining whether the burn can be safely held, and for making the decision to terminate or to continue the burn.
D. The Burn Boss will make the decision to terminate the Burn. The Holding Specialist will direct personnel to suppress the fire using the appropriate response.
E. The Burn Boss will make the decision to terminate or to continue the burn.

Date Each Action is Initiated:

A. _____ B. _____ C. _____ D. _____ E. _____

Designator and Description: Spot fires (includes slop-overs)
Condition: Spot fires occur
Management Intent: Contain spot fires as quickly as safety allows to reduce the risk of an escape fire.
Recommended Action to Consider:

A. If a spot fire occurs and it is safe to do so, the person discovering the fire will immediately extinguish the spot fire. After the spot fire is extinguished, the Holding Specialist will be notified via the radio.
B. If a spot fire occurs that cannot be extinguished by the person who discovers it, they will notify the Holding Specialist of the spot fire via the radio. The discovering person will provide a brief size up of the fire and identify the resources needed to suppress the fire. The Holding Specialist will shift burn resources to the location of the spot fire and direct suppression efforts until the spot fire is contained.
C. If a spot fire occurs that exceeds the capabilities of on-site burn resources, the Holding Specialist will notify the Burn Boss of the need for additional resources. The Burn Boss will order the contingency resources identified in the IAP. Suppression efforts will continue until the spot fire is contained.
D. If a spot fire occurs that cannot be contained by burn personnel and contingency resources within the next operational period, if additional resources not identified in the contingency plan are required, or if there is an immediate threat to life and property that cannot be mitigated by burn personnel and contingency resources, the Burn Boss will declare the burn to be a wildfire. See Element 18 for more information on converting the prescribed burn to a wildfire.

Recommended Resources:

A. Holding Specialist, burn personnel
B. Holding Specialist, burn personnel
C. Holding Specialist, Burn Boss
D. Holding Specialist, Burn Boss

Time Frame:

A. Immediately
B. The size up and request for resources will be made immediately upon discovery of the spot fire.
C. Immediately
D. Wildfire declaration will occur as soon as it is clear that on-site resources will not be sufficient for containing the spot fire within the next operational shift.

Describe the consequences of not taking the recommended actions:

A. Spot fires may damage park resources and threaten life and private property.
B. Spot fires may damage park resources and threaten life and private property.
C. Spot fires may damage park resources and threaten life and private property.
D. Spot fires may damage park resources and threaten life and private property.

Responsibility:

A. The person discovering the spot fire.
F. The person discovering the spot fire is responsible for sizing up the fire and determining the resources necessary to suppress the spot fire. The Holding Specialist is responsible for shifting burn resources to suppress the spot fire and directing suppression efforts.
G. The Holding Specialist is responsible for requesting additional resources to aid suppression efforts. The Burn Boss is responsible for activating contingency resources.
H. The Burn Boss is responsible for making the final determination whether or not the spot fire can be contained by on-site resources within the next operational period. The Burn Boss is responsible for declaring a wildfire.

Date Each Action is Initiated:

A. _____ B. _____ C. _____ D. _____ E. _____

B. Additional Resources and Maximum Response Time(s):

The following resources may be used as contingency resources during the burn. At least one Type 6 Engine or larger must be available as a contingency resource within a 2 hour response time for the operational period. The availability of contingency resources will be verified prior to ignition and be identified in the Incident Action Plan. If identified contingency resources become unavailable, then the prescribed fire shall be considered out of prescription until alternate contingency resources are identified. All contingency resources working on the fire line must meet NWCG qualifications.

Project Name	Contingency Resource	Maximum Response Time
All Burn Units	Murfreesboro Fire Department	30 minutes
	Rutherford County Fire Department	30 minutes
	Natchez Trace Parkway – Type 6 Engine	1.5 hours
	TN Dept. of Forestry Engines/Dozers	2 hours

Element 18: Wildfire Conversion

A. Wildfire Declared By:

If the Burn Boss determines that contingency actions will not be successful in containing the fire by the end of the next operational period, or if there is an immediate threat to life and property that cannot be mitigated by burn personnel and contingency resources, the Burn Boss will convert the prescribed fire to wildfire status (escaped fire). A WFDSS will be completed by the Natchez Trace Parkway Fire Management Officer to determine the appropriate fire strategy in accordance with DO18 and park policy.

B. IC Assignment:

An Incident Commander at the appropriate IQCS level will be assigned based on incident complexity.

C. Notifications:

The Burn Boss will notify the Natchez Trace Parkway Fire Management Officer and the Stones River Superintendent of the change in fire status. Additional resources will be ordered through the respective state interagency coordination center.

D. Extended Attack Actions and Opportunities to Aid in Fire Suppression:

The Incident Commander will consult with the incoming Incident Commander to determine extended attack actions and opportunities to aid in suppressing fire.

Element 19: Smoke Management and Air Quality

A. Compliance:
No additional smoke management or air quality compliance is required for this project.

B. Permits to be Obtained:
A burn permit will be obtained from the Tennessee Forestry Commission as per state air quality regulations.

C. Smoke Sensitive Areas/Receptors:
The following table lists smoke sensitive areas that are within 3 miles of the burn units. The Burn Boss is responsible for considering these receptors when evaluating a potential burn day. Please refer to Appendix A for project and vicinity maps.

Unit Name	Smoke Sensitive Area/Receptor	Direction from the Burn Unit	Distance (miles)
- Northern Fields and Woodlands - Western Fields and Woodlands - Eastern Fields and Woodlands	Murfreesboro Airport	E	2.8
- Fortress Rosecrans - Redoubt Brannan	Murfreesboro Airport	NE	2.2

D. Potential Impacted Areas:
Local roads, residential areas, and businesses may be impacted by smoke. The Burn Boss will make the necessary operational changes to mitigate smoke concerns.

E. Mitigation Strategies and Techniques to Reduce Smoke Impacts:
The burn prescription in Element 7 outlines the acceptable weather conditions that will help to mitigate smoke impacts to local communities and roadways. Smoke warning signs will be placed on roadways at locations determined by the Burn Boss based on forecasted wind direction and expected smoke dispersal. Forecasted wind directions will be a primary consideration when determining which unit to burn in order to ensure that smoke will be dispersed away from roads and smoke sensitive receptors. Smoke emissions and roadway visibility will be monitored during the burn. The Burn Boss may utilize burn personnel for traffic control or request a temporary road closure as needed. See Element 17 for contingency actions regarding smoke impacts.

Element 20: Monitoring

Monitoring associated with prescribed fire operations ensures prescription elements are valid for meeting stated objectives, documents pre- and post-fire conditions, ensures progress toward desired future conditions is being made, and short and long term objectives are being realized. Monitoring on this project may occur pre-burn, during operations, and post-burn.

A. Fuels Information Required and Procedures:
NPS FMH fire effects plots are established and maintained by the NATR Fire Effects Monitoring Crew. Pre-fire treatment data will be collected on these plots according to the Fire Monitoring Plan for these monitoring types. NATR staff shall monitor environmental conditions to determine when a particular burn unit may come into prescription.

B. Weather Monitoring (Forecasted and Observed) Required and Procedures:
A qualified Fire Effects Monitor (FEMO) will be assigned for each treatment. During the burn, the FEMO will be responsible for documenting the on-site weather, smoke, and fire behavior observations according to National Park Service monitoring protocols. The FEMO will broadcast current weather observations to burn personnel at intervals determined by Burn Boss or designee. Following the burn, the FEMO will complete a fire monitoring report that summarizes weather observations during the burn.

C. Fire Behavior Monitoring Required and Procedures:
The FEMO will document fire behavior observations during the burn as per National Park Service monitoring protocols. Following the burn, the FEMO will complete a fire monitoring report that summarizes fire behavior observations in relation to weather conditions and ignition operations.

D. Monitoring Required to Ensure that Prescribed Fire Plan Objectives are Met:
The assigned FEMO will document whether objectives were met in a postburn FEMO report. Long-term evaluation of the burn may be conducted by NATR fire effects staff to document fire related changes over time and to ensure long-term objectives are being met. This monitoring will comply with current NPS standards for the monitoring type and will be summarized by the NATR Fire Ecologist in annual reports.

E. Smoke Dispersal Monitoring Required and Procedures:
The FEMO will document smoke dispersal during the burn as per National Park Service monitoring protocols. These observations will be included in the post-burn fire monitoring report.

Element 21: Post-burn Activities

Post-burn Activities That Must be Completed:
After the burn, the FEMO will complete a fire monitoring report summarizing fire behavior, smoke, and weather observations along with first order fire effects. The burn boss or designee will input reporting information into NFPORS and the DI-1202. NATR Fire Management Staff will maintain a project file that includes:

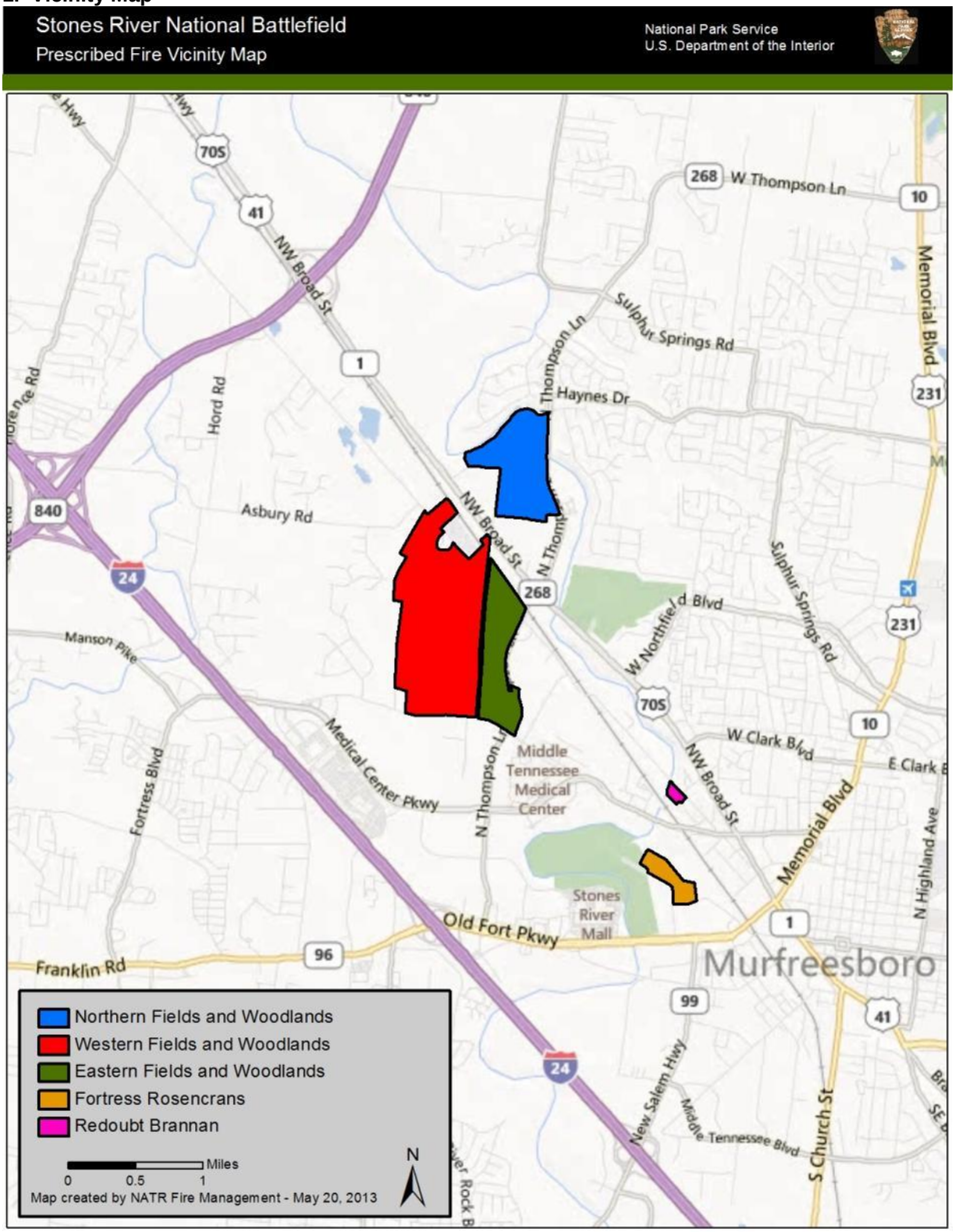
A. Original signed prescribed fire burn plan
B. Agency Administrator Go/No-go Pre-Ignition Approval
C. Operational Go/No-Go Checklist
D. IAPs
E. Monitoring data including weather, fire behavior and fire effects observations
F. Weather forecasts
G. Notification list
H. Job Hazard Analysis with signatures
I. Post-burn fire report

Appendices

A. Maps: Vicinity, Smoke, and Project
B. Technical Review Checklist
C. Complexity Analysis
D. Job Hazard Analysis
E. Fire Behavior Modeling Documentation or Empirical Documentation
F. Holding Resources Worksheet
G. Medical Plan
H. Test Fire Documentation
I. Required Notification List
J. Contact List

Appendix A: Vicinity, Smoke, and Project Maps

1. Vicinity Map



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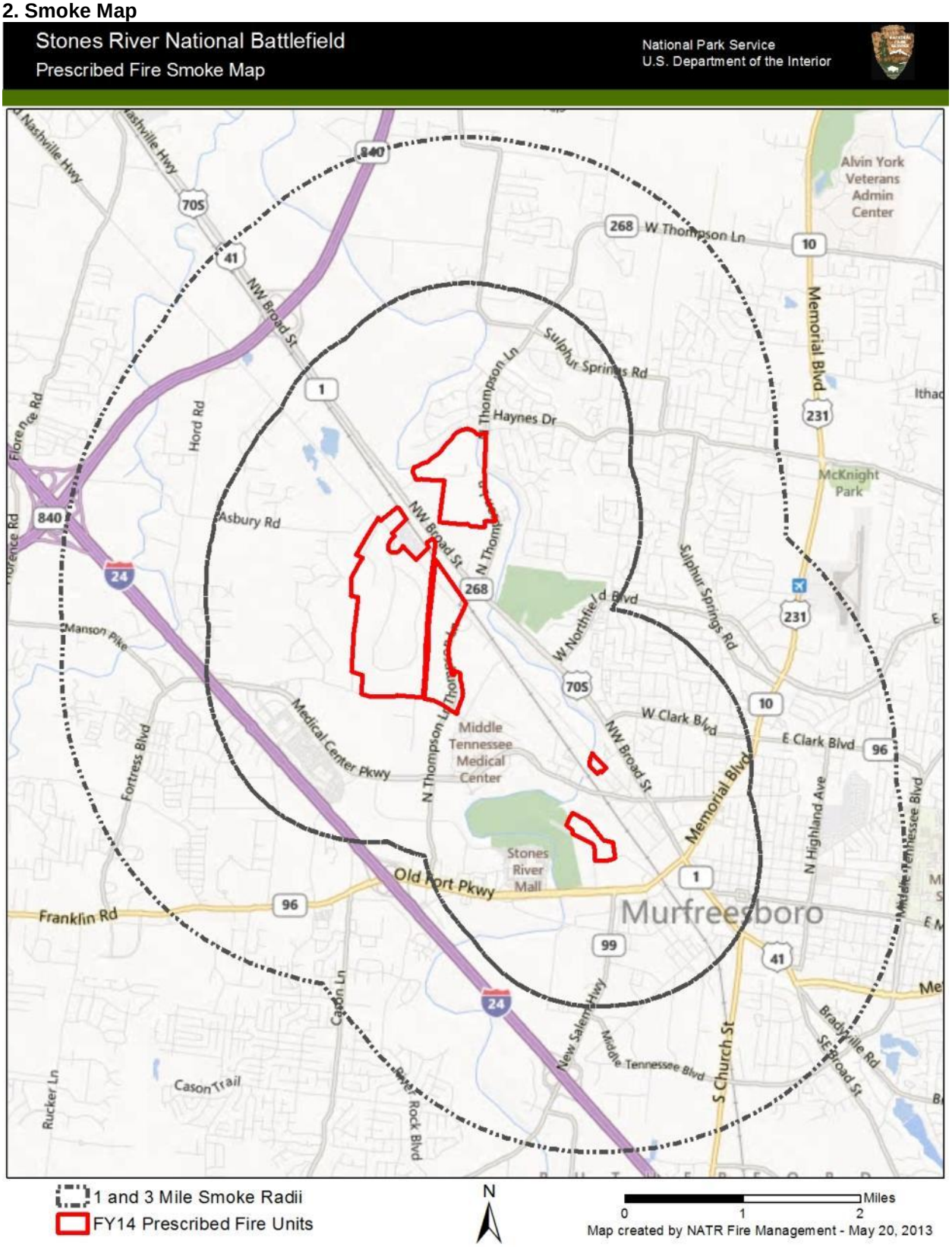
2. Smoke Map



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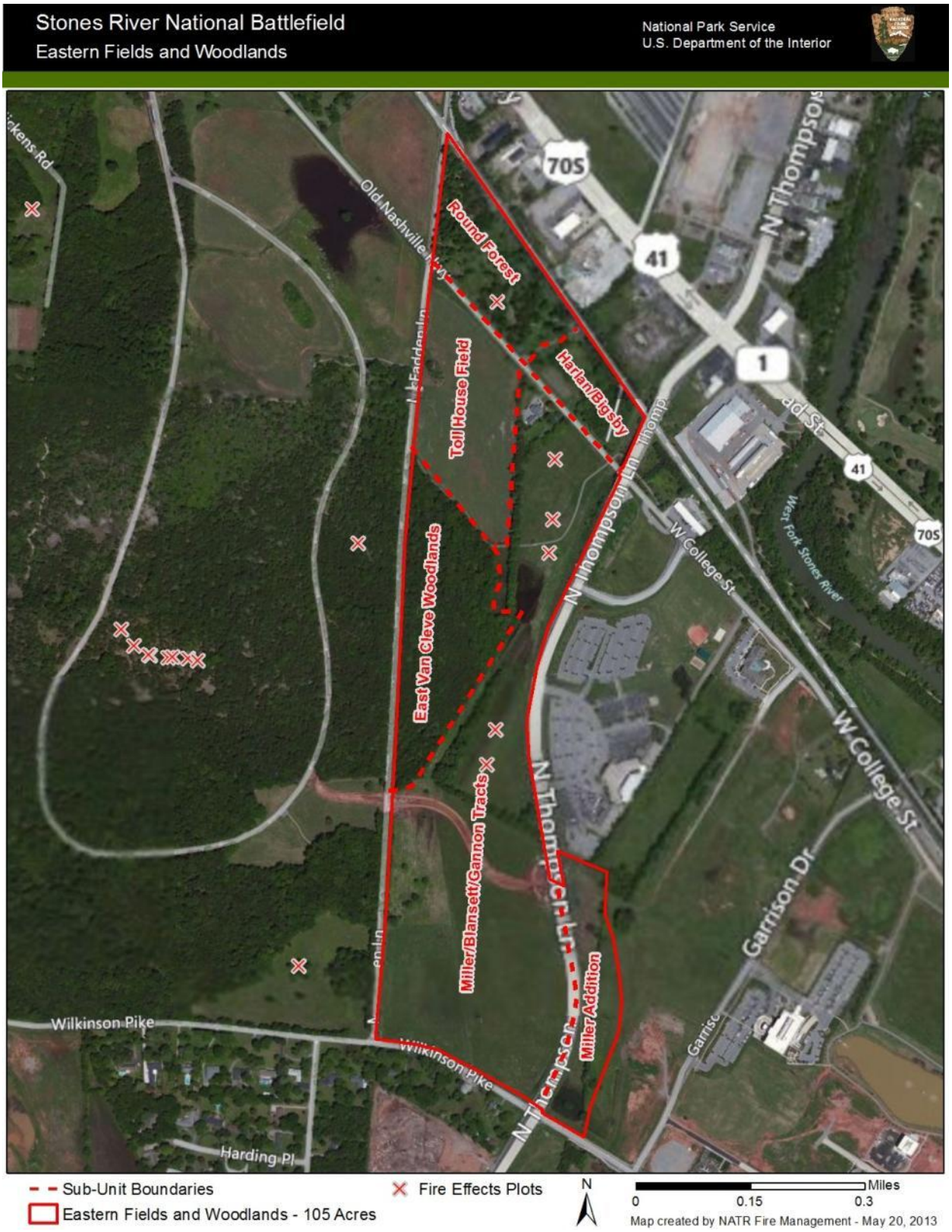
3. Project Maps

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan



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Appendix B: Technical Reviewer Checklist

Fill out this checklist based on the guidance provided in the Technical Review section in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484. Rate each element in the following table with an "S" for Satisfactory or "U" for Unsatisfactory. Use Comment field as needed to support the element rating.

PRESCRIBED FIRE PLAN ELEMENTS	RATING	COMMENTS
1. Signature page	S	
2. A. Agency Administrator Ignition Authorization, PMS 485	S	
2. B. Prescribed Fire GO/NO-GO Checklist, PMS 486	S	
3. Complexity Analysis Summary	S	
4. Description of Prescribed Fire Area	S	4/C reference dates for bats
5. Objectives	S	
6. Funding	S	
7. Prescription: Prescription Narrative and Prescription Parameters	S	
8. Scheduling	S	Reference dates for bats
9. Pre-Burn Considerations and Weather	S	9/C might note the appendix here
10. Briefing	S	
11. Organization and Equipment	S	
12. Communication	S	
13. Public and Personnel Safety, Medical	S	13/C last bullet, NATR dispatch ?
14. Test Fire	S	
15. Ignition Plan	S	
16. Holding Plan	S	
17. Contingency Plan	S	Page 26 formatting letters for
18. Wildfire Declaration	S	
19. Smoke Management and Air Quality	S	
20. Monitoring	S	
21. Post-Burn Activities	S	
Appendix A: Maps	S	
Appendix C: Complexity Analysis	S	
Appendix D: Job Hazard Analysis	S	
Appendix E: Fire Behavior Modeling Documentation	S	
Appendix F: Adequate Holding Resources Worksheet	S	
Appendix G: Medical Plan	S	

X☐ **Approval is recommended** subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.

☐ **Recommendation for approval is not granted**. Prescribed fire plan should be re-submitted for technical review subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.

Technical Reviewer Signature: /s/ Shane Sturgill Qualification and Currency: RXB2/Y

Date Signed: January 26,2014

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

Reviewer Comments-STRI Burn Units Prescribed Burn Plan

Please note any comments you may have pertaining to this prescribed fire plan.

RESOURCE MANAGER, TROY MORRIS

CHIEF OF OPERATIONS, GIB BACKLUND

SUPERINTENDENT, GAYLE HAZELWOOD

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

Appendix C: Complexity Analysis

Prescribed Fire Complexity Rating System Guide Worksheet

Project Name Stones River FY14-18 Prescribed Fire Plan Number _____

Complexity elements:

1. Potential for Escape

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	There is potential for spot fires outside of unit boundaries. The Probability of Ignition may exceed 60%. Some residual fire may persist into the second or third day.
Final Rating: ***Low*** ***Moderate*** ***High***	Fuel concentrations along control lines will be adequately dispersed prior to ignition. Blacklining will typically utilize lower intensity backing and flanking fires to create a buffer along fire lines. Most unit boundaries are easily accessible by engines, UTVs, or ATVs. The burn prescription should result in low to moderate fire behavior which should be easily contained by available resources.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Spots outside of burn units could threaten private property and or park infrastructure.
Final Rating: ***Low*** ***Moderate*** ***High***	Areas of holding concern will be thoroughly prepped and inspected by the Burn Boss prior to ignition. Fire lines will be frequently patrolled to ensure that spot fires and slop-overs are quickly located and extinguished. Ignition patterns will be adjusted and/or the burn terminated if spotting becomes problematic and assigned resources become bogged down by frequent spotting or slop-overs.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Portions of the fireline are not accessible by engine but are accessible by UTV or ATV. Some key personnel may be from outside of the local area.
Final Rating: ***Low*** ***Moderate*** ***High***	Holding operations do not require supervision at higher than the Single Resource Boss level. Crews will scout access to critical holding areas on any units along the park boundary. Resources may be pre-positioned in these areas to allow rapid response in the event of spot fires.

2. The Number and Dependency of Activities

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Coordination between blacklining operations and interior ignition operations will be required.
Final Rating: ***Low*** ***Moderate*** ***High***	A detailed firing plan will be discussed with all burn personnel at the pre-burn briefing. Coordination is easily maintained through radio communication.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Failure to coordinate interior ignition operations with holding (or perimeter firing) operations could result in either a high likelihood of escape and / or injury to assigned resources.
Final Rating: ***Low*** ***Moderate*** ***High***	The Burn Boss will ensure that adequate communications exist between burn personnel. Look outs may be posted where needed to facilitate communication and coordination. The Firing Boss shall maintain communications with ignition personnel and holding forces to ensure coordination of ignition operations. All personnel assigned to ignition will have a working radio.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Terrain may make visual contact difficult. Radio contact between ignition and holding forces will be necessary to maintain adequate coordination and reduce the risk of escape or injury.
Final Rating: ***Low*** ***Moderate*** ***High***	Communication plans have been established and identified in the burn plan and will be addressed day of burn in IAPs. Lookouts will be established where vision and communications may be impaired do to topography.

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3. Off-Site Values

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Private land adjacent to park boundary. Some private structures are adjacent to burn unit. Roads may be impacted by smoke.
Final Rating: ***Low*** ***Moderate*** ***High***	Fire lines will be prepped to reduce the risk of spot fires and slop-overs. Fire lines will be patrolled to ensure that spot fires and slop-overs are quickly located and extinguished. Firing patterns and ignition techniques will take advantage of winds and topography to minimize threat to improvements on private or other agency lands adjacent to unit boundaries.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Some private structures are adjacent to burn unit. Visitor use will be impacted during some burn, as trails and visitor use areas exist in and adjacent to some burn units.
Final Rating: ***Low*** ***Moderate*** ***High***	Fire lines will be prepped and patrolled to reduce the risk of escape fires. Firing patterns and ignition techniques will help reduce the potential for spot fires and slop-overs. Visitor use impacts will be of short duration, and closures are only expected for the day of the burn.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Protection of off-site values will require continuous communication to reduce the risk of spot fires and slop-overs onto private land.
Final Rating: ***Low*** ***Moderate*** ***High***	Most unit boundaries are easily accessible by engines, UTVs, or ATVs. Fire lines will be frequently patrolled to ensure that spot fires and slop-overs are quickly located and extinguished. Resources may be pre-positioned along critical holding areas to allow rapid response in the event of spot fires. Coordination between firing and holding operations is easily achieved, and will be maintained throughout the burn using radio communications.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

4. On-Site Values

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	There are numerous monuments, signs, and interpretive markers located within and adjacent to the burn units. Traffic on local roadways may be impacted by smoke.
Final Rating: ***Low*** ***Moderate*** ***High***	Park structures, improvements, and cultural sites within the burn units will be prepped prior to ignition to help reduce potential impacts from fire. Resources will be pre-positioned at critical holding areas during the burn. Ignition around park structures, improvements, and cultural sites will focus on low intensity backing fire to reduce the potential impacts from fire. Smoke warning signs will be placed on local roads at the discretion of the Burn Boss.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Fire could damage park structures and improvements if prep work and holding is unsuccessful. Smoke could impact traffic on local roads if outlined mitigation measures are not followed.
Final Rating: ***Low*** ***Moderate*** ***High***	The required prep work around structures and improvements is easily accomplished. Structures and improvements requiring protection will be identified on the project map in the IAP and discussed at the pre-burn briefing. A detailed firing plan will be discussed at the pre-burn briefing. Coordination between firing and holding operations is easily achieved and maintained using radio communications.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Protection of park structures and improvements will require coordination between firing and holding operations.
Final Rating: ***Low*** ***Moderate*** ***High***	The required prep work around structures and improvements is easily accomplished. Structures and improvements requiring protection will be identified on the project map in the IAP and discussed at the pre-burn briefing. A detailed firing plan will be discussed at the pre-burn briefing.

5. Fire Behavior

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Fuels vary somewhat throughout the units and some units contain moderate fuel loadings. Terrain in several units is varied and should affect fire behavior.
Final Rating: ***Low*** ***Moderate*** ***High***	Heavy fuel concentrations along control lines will be adequately dispersed prior to ignition. Spotting is expected to be short range, primarily from wind driven fire in surface fuels.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Fire behavior outside of the unit will be similar to fire inside the unit. In many cases burn units are surrounded by barren areas, maintained lawns, or agricultural fields that typically do not burn.
Final Rating: ***Low*** ***Moderate*** ***High***	No change.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Limited types, kinds, and numbers of resources will be required to implement the prescribed burn. Standard safety practices will be effective, safety zones identified and easily accessed. Direct attack should be effective at controlling spot fires.
Final Rating: ***Low*** ***Moderate*** ***High***	No change.

6. Management Organization

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Several overhead positions will require fully qualified personnel; Burn Boss Type 2 (RXB2), Firing Boss (FIRB), Incident Commander Type 5 (ICT5), Engine Operator (ENOP), and a Fire Effects Monitor (FEMO). Span of control will be appropriate for the expected complexity.
Final Rating: ***Low*** ***Moderate*** ***High***	No change.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Problems related to supervision or communication may cause failure to meet burn objectives or lead to an increased chance of escaped fire.
Final Rating: ***Low*** ***Moderate*** ***High***	Span of control will not be exceeded, and fully qualified personnel will occupy overhead positions. When and where trainees are used, fully qualified personnel will be assigned as trainers; trainers will have no additional duties.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Most burn personnel are expected to be from the Natchez Trace Parkway or Stones River National Battlefield and are familiar with the burn units and local conditions. Personnel from other parks, Agencies, or organizations may be utilized provided they meet all NWCG requirements.
Final Rating: ***Low*** ***Moderate*** ***High***	No change.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

7. Public and Political Interest

Risk	Rationale
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Most burn units are adjacent to local roadways or residential areas and will be highly visible to the public.
Final Rating: ***Low*** ***Moderate*** ***High***	Press releases may be issued to local media. While interest may be high, no public or political controversy is expected
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Traffic may be affected if unexpected or adverse events occur. Adverse effects could include damage to park infrastructure and cultural sites, which would draw attention and delay implementation of future projects.
Final Rating: ***Low*** ***Moderate*** ***High***	Adverse effects are easily prevented using the mitigation measures outlines in this plan. Please refer to the On-Site and Off-Site values sections of this Complexity Analysis. Press releases will be issued for prescribed fires in developed or high use areas.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Public information personnel are not required on any burn, but may be utilized at the discretion of the Burn Boss.
Final Rating: ***Low*** ***Moderate*** ***High***	No change.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

8. Fire Treatment Objectives

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Objectives include ecosystem restoration and maintenance.
Final Rating: ***Low*** ***Moderate*** ***High***	Objectives are readily achieved using low to moderate intensity fire. Vegetation in the burn units is mostly fire tolerant or fire dependent. Long term monitoring will be conducted in selected burn units.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Failure to achieve resources management objectives could result in long term effects, such as excessive mortality of overstory trees.
Final Rating: ***Low*** ***Moderate*** ***High***	Objectives are readily achieved using low to moderate fire intensities. The burn prescription will reduce the potential for burning under conditions that would result in short or long term damage to park vegetation.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Monitoring is necessary during the burn to ensure that objectives are being met.
Final Rating: ***Low*** ***Moderate*** ***High***	A Fire Effects Monitor (FEMO) is required for all burn units.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

9. Constraints

Risk	**Rationale**
Preliminary Rating: ***Low Moderate High***	Access to some control lines using ATVs, UTVs and Engines could be limited due to terrain or wet conditions.
Final Rating: ***Low Moderate High***	Fire lines that are inaccessible to motor vehicles will be prepped prior to ignition, and are easily accessible to foot traffic.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low Moderate High***	Some burn opportunities could be missed due to scheduling conflicts and competition for resources.
Final Rating: ***Low Moderate High***	Coordination with other parks and agencies is easily accomplished and should reduce conflicts.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low Moderate High***	Constraints may increase the difficulty associated with completing the project. Coordination with other parks and agencies is easily accomplished and should reduce conflicts.
Final Rating: ***Low Moderate High***	Constraints are not expected to increase the difficulty associated with completing the project.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

10. Safety

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Most safety concerns are easily mitigated, but several concerns require continual monitoring by burn personnel; smoke impacts on roadways, hazard trees, footing, and environmental hazards.
Final Rating: ***Low*** ***Moderate*** ***High***	LCES will be in place and discussed at daily briefings and AARs. Smoke impacts will be monitored throughout the burn period. Please see Elements 7, 9, 13, 17, and 19 for smoke mitigation measures.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	There is moderate potential for accidents or injury to burn personnel and the public, mostly related to potential smoke impacts on local roadways.
Final Rating: ***Low*** ***Moderate*** ***High***	Smoke impacts will be monitored throughout the burn period. Please see Elements 7, 9, 13, 17, and 19 for smoke mitigation measures.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LCES will be implemented and revised as needed during all phases of the project.
Final Rating: ***Low*** ***Moderate*** ***High***	Daily briefings will address safety concerns and mitigation measures. Smoke impacts will need to be continually monitored. The smoke management requirements identified in Elements 7, 9, 13, 17, and 19 in this plan should be adequate to mitigate safety concerns.

11. Ignition Procedures/Methods

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Firing sequence and timing are somewhat critical and coordination will be required. Visibility on some units may be limited in areas due to topography and fuels.
Final Rating: ***Low*** ***Moderate*** ***High***	Radio communication is easily maintained and will mitigate concerns where visibility is limited. All ignition personnel will have a working radio.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	The coordination of firing efforts must be maintained to meet objectives and provide for safety of personnel and minimize potential for escape or spotting.
Final Rating: ***Low*** ***Moderate*** ***High***	Firing operations will be discussed at the pre-burn briefing.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Ground ignition will be used for all burn units. Aerial ignition will not be used. Coordination of efforts and adjustments to timing will be necessary to meet burn objectives.
Final Rating: ***Low*** ***Moderate*** ***High***	Coordination of firing operations is easily accomplished, but will require monitoring throughout the burn. Firing operations will be discussed at the pre-burn briefing.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

12. Interagency Coordination

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	There are no interagency concerns expected for this project. The burns are not expected to take place during the time of year when Planning Level restriction are normally in place.
Final Rating: ***Low*** ***Moderate*** ***High***	Burns may include personnel from the National Park Service, US Forest Service, and other federal, state, and private agencies as long as all NWCG requirements are met.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Most burns can be accomplished using NPS personnel.
Final Rating: ***Low*** ***Moderate*** ***High***	On larger burns interagency coordination issues may arise due to scheduling conflicts, which could delay completion of the project.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	There are no special interagency agreements needed for the projects outlined in this plan.
Final Rating: ***Low*** ***Moderate*** ***High***	Scheduling conflicts could arise on larger projects requiring interagency assistance.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

13. Project Logistics

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Supplies needed are readily available and minimal logistical support is needed.
Final Rating: ***Low*** ***Moderate*** ***High***	No change.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Logistical support problems may affect completion of project.
Final Rating: ***Low*** ***Moderate*** ***High***	Logistical concerns should be easily handled by burn personnel and/or Stones River staff.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Out-of-area personnel may need additional logistical support.
Final Rating: ***Low*** ***Moderate*** ***High***	No change.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

14. Smoke Management

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Smoke may impact local roadways.
Final Rating: ***Low*** ***Moderate*** ***High***	Smoke signs will be in place and traffic control personnel may be used. Burns may be terminated or road closures enforced if smoke impacts create unsafe driving conditions. Refer to Elements 7, 9, 13, 17, and 19 for smoke management information.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Smoke may impact local roadways. Firefighters may experience heavy smoke concentrations and need to be rotated into fresh air.
Final Rating: ***Low*** ***Moderate*** ***High***	Refer to Elements 7, 9, 13, 17, and 19 for smoke management information.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	Impacts to local roadways are possible and mitigation measures will be necessary.
Final Rating: ***Low*** ***Moderate*** ***High***	The wind and smoke dispersion parameters in Element 7 should be adequate to reduce the potential smoke impacts to local roads and communities. The mitigation measures outlined in Elements 7, 9, 13, 17, and 19 should be adequate for reducing safety concerns due to smoke.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

COMPLEXITY RATING SUMMARY

RISK	OVERALL RATING **Moderate**
POTENTIAL CONSEQUENCES	OVERALL RATING **Moderate**
TECHNICAL DIFFICULTY	OVERALL RATING **Moderate**
SUMMARY COMPLEXITY RATING	**Moderate**

RATIONALE:
This project has been given a moderate rating due to fuels, fire behavior, the potential need for outside resources, and the potential for smoke impacts to local roadways and residences.

Smoke impacts to motorist visibility are the primary concern, as most units are in close proximity to public roadways. Refer to Elements 7, 9, 13, 17, and 19 for mitigation measures to reduce smoke impacts from burning.

Operations will normally be conducted with local staff in the critical overhead positions. Span of control will not exceed standard protocols, and the need for qualifications at the strike team or task force level in the regular burn organization is not anticipated.

No special logistical concerns are anticipated. The treatment areas are readily accessible by burn personnel and contingency resources. Some limited logistical and supply functions may be provided by staff from the fire management office if necessary, but none are expected to exceed the capability of the existing support staff.

Prepared by: _____ Date: _____
Travis Neppl, RXB2
Fuels Management Specialist, Natchez Trace Parkway

Approved by: _____ Date: _____
Gayle Hazelwood
Superintendent, Stones River National Battlefield

Appendix D: Job Hazard Analysis

U.S. Department of the Interior National Park Service	1. WORK PROJECT/ACTIVITY **Prescribed Fire Operations**	2. LOCATION **Stones River National Battlefield**	3. UNIT **STRI**
JOB HAZARD ANALYSIS (JHA) References-DM-18, RM18, Fireline Handbook, Interagency Prescribed Fire Planning and Implementation Proceedures Ref. Guide	4. NAME OF ANALYST **Travis Neppl**	5. JOB TITLE **Fuels Management Specialist**	6. DATE PREPARED **5/29/13**

7. TASKS/PROCEDURES	8. HAZARDS	9. MITIGATION
***Travel to, from and on Project.**	Motor vehicle accidents Slippery road surfaces,soft shoulders,unimproved and narrow roadways. Weather darkness, smoke.	Driving Defensively. Use seat belts. Identify road conditions and hazards during briefings. Use Headlights and overheads. Perform preuse inspections on equipment. Scout roads and identify turnouts before ignition of project. Maintain communications. Provide road system map for project. Use Backers and chock vehicle tires. Have vehicles facing out.
***Qualifications For assigned Position**	Lack of Experience Injuries	Workers used on burn assignments shall meet age,health, and physical requirements established for arduous firefighting duties. Positions will be filled using fully qualified persons or trainees meeting 310-1 requirements AND be assigned with a dedicated trainer.
***Briefing**	Lack of communications	Provide an operational briefing before each shift. Briefing will clarify organization, responsibilities, communications, hazards, weather, expected fire behavior, and medical plan.
***Protective Clothing and equipment**	Injuries,burns and death	Wear Hard hat with chin strap, safety glasses, Nomex Fire resistant pants and shirts NFPA 1977 compliant. Keep sleeves rolled down. Wear leather,lace type, boots with skid resistant soles, and tops at least 8 inches high. Carry drinking water and fire shelter. Wear OSHA approved firefighting gloves. wear hearing protection when working around equipment where noise level exceeds 90 dba. Wear additional protective equipment as dictated by local conditions and exposure to special equipment.
***Lighters**	Injuries and death falls,snags,bees, snakes,smoke, burns, rolling material.	Always have an escape route . Maintain LCES. Follow the Standard Fire Orders and Watch Out Situations. Maintain communications with other Lighters and Firing Boss. Hand held radios shall be provided to all lighters. Do not fill drip torches near ignition sources. Avoid spilling drip torch fuel on clothing.
***Fuel Mixing**	Burns, spills, fuel saturated clothing and boots.	No smoking within 25 feet of mixing and filling area. Do not fill or mix in pick up beds with bed liners. Avoid the use of cellular telephones in and around fill or mixing area. Avoid fuel contact with bare hands, clothing and boots. Provide pour spouts. Use only approved fuel containers for storage and transport.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

***Holding/Mop Up/Patrol Crews**	Smoke,burns,Falls, back injuries, bees, posion oak,snags, rolling material,eye injuries. Heat Stress. Dehydration CO Poisoning	Wear PPE's listed above. LCES, Follow Standard Fire Orders and Watch out Situations. Identify hazards in work area. Flag hazards for others. Use warning lights and provide traffic control on roadways during smoky and night operations. Maintaining a high level of aerobic fitness is one of the best ways to protect yourself against heat stress. Drink lots of fluids before,during and after work. Periodically rotate crews from work sites with high smoke levels to areas of less smoke or smoke free areas. Protective clothing and equipment shall be the same as required for firefighting. Crews shall follow all guidelines in the NWCG Fireline Handbook Chapter 5 Firefighting Safety (Rev. 3/2004 or latest). Maintain communications with the Firing Boss.
***Hand Tools**	Puncture wounds, cuts, splinters	Ensure tools are maintained in safe condition through regular inspection and maintenance. Monitor employee performance to ensure safe practices are employed. Maintain safe distances between personell when working or hiking. Keep tools sheathed when not in use. Properly store tools for transport.
***Chain Saw Operation**	Inexperienced operators, snags / widow makers, saw cut injuries, falling hazards	Sawyers and swampers shall have completed S212 and be red carded or under the supervision of a qualified sawyer. Call out appropriate warnings during falling operations. Be aware of adjacent ongoing operations and crews, warn all on site personnel of pending falling operations and locations. Be aware of and maintain situational awareness of snags, broken limbs, and hang-ups. Use spotters. Sawyers and swampers shall where all required PPE including chaps. Avoid contacting bar tip with objects to reduce potential for kick-back. Use proper felling techniques and proceedures.
***Portable Pump Operation**	Burns from pump motor, refueling hazards, draft site injuries, back injuries	Operator must have completed S211. Ensure pump is set up correctly and in a secure position. Use proper lifting and carrying techniques, ask for assistance. Watch footing around water sources, be allert for slip hazards. Allow for required warm-up and cool down times during use. Ensure pump has cooled prior to refueling. Where hearing protection when operating pump. Advise other personnel prior to shutting down or starting up pump.
***ATV Operation**	Roll over, accidents	ATV operators shall be certified for ATV use. Maintain safe operating speeds for the conditions. Avoid side hill situations. Do not overload racks in order to reduce instability issues. Where approved helmets when not on burn units, or hard hats with chin straps when on burn units. Full PPE Required for operation.
***UTV Operation**	Roll over, accidents	Only personnel who have been certified for UTV use may operate one. Regular firefighting PPE will be used. Gloves on. Chinstrap down. Eye protection. Avoid over-loading cargo racks. UTV's with heavy loads or awkward attachments should stay off of steep or uneven terrain.
***Emergency Evacuation Procedures (EEP)**	Serious illness injuries	Notify Burn Boss, request medical response from the responsible medical first responders. Provide type of injury,location,access, number of patients. Verify local host park emergency response proceedures. Identify First Responders, EMTs and available medical equipment on project during briefing.
10. LINE OFFICER SIGNATURE		11. TITLE / 12. DATE

(over)

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

JHA Instructions

The JHA shall identify the location of the work project or activity, the name of employee(s) writing the JHA, the date(s) of development, and the name of the appropriate line officer approving it. The supervisor acknowledges that employees have read and understand the contents, have received the required training, and are qualified to perform the work project or activity.

Blocks 1, 2, 3, 4, 5, and 6: Self-explanatory.

Block 7: Identify all tasks and procedures associated with the work project or activity that have potential to cause injury or illness to personnel and damage to property or material. Include emergency evacuation procedures (EEP).

Block 8: Identify all known or suspect hazards associated with each respective task/procedure listed in block 7. For example:

a. Research past accidents/incidents
b. Research the Health and Safety Code, or other appropriate literature.
c. Discuss the work project/activity with participants
d. Observe the work project/activity
e. A combination of the above

Block 9: Identify appropriate actions to reduce or eliminate the hazards identified in block 8. Abatement measures listed below are in the order of the preferred abatement method:

a. Engineering Controls (the most desirable method of abatement). For example, ergonomically designed tools, equipment, and furniture.
b. Substitution. For example, switching to high flash point, non-toxic solvents.
c. Administrative Controls. For example, limiting exposure by reducing the work schedule; establishing appropriate procedures and practices.
d. PPE (least desirable method of abatement). For example, using hearing protection when working with or close to portable machines (chain saws, rock drills portable water pumps)
e. A combination of the above.

Block 10: The JHA must be reviewed and approved by a line officer. Attach a copy of the JHA as justification for purchase orders when procuring PPE.

Blocks 11 and 12: Self-explanatory.

Emergency Evacuation Instructions

Work supervisors and crew members are responsible for developing and discussing field emergency evacuation procedures (EEP) and alternatives in the event a person(s) becomes seriously ill or injured at the worksite.

Be prepared to provide the following information:

a. Nature of the accident or injury (avoid using victim's name).
b. Type of assistance needed, if any (ground, air, or water evacuation)
c. Location of accident or injury, best access route into the worksite (road name/number), identifiable ground/air landmarks.
d. Radio frequency(s).
e. Contact person.
f. Local hazards to ground vehicles or aviation.
g. Weather conditions (wind speed & direction, visibility, temp).
h. Topography.
i. Number of person(s) to be transported
j. Estimated weight of passengers for air/water evacuation.

The items listed above serve only as guidelines for the development of emergency evacuation procedures.

JHA and Emergency Evacuation Procedures Acknowledgment

We, the undersigned work leader and crew members, acknowledge participation in the development of this JHA (as applicable) and accompanying emergency evacuation procedures. We have thoroughly discussed and understand the provisions of each of these documents:

SIGNATURE	DATE	SIGNATURE	DATE
Work Leader			

Appendix E: Fire Modeling Documentation

BehavePlus 5.0.5 (Build 307)

TL6 - Moderate Load Broadleaf Litter

Tue, May 28, 2013 at 11:07:22

Inputs: SURFACE, SIZE, CONTAIN, SPOT, SCORCH, IGNITE

Input Variables		Units	Input Value(s)
Fuel/Vegetation, Surface/Understory			
	Fuel Model		TL6
Fuel/Vegetation, Overstory			
	Downwind Canopy Height	ft	80
Fuel Moisture			
	1-h Moisture	%	5
	10-h Moisture	%	6
	100-h Moisture	%	7
	Live Herbaceous Moisture	%	30
	Live Woody Moisture	%	50
Weather			
	20-ft Wind Speed (upslope)	mi/h	20
	Wind Adjustment Factor		0.4
	Air Temperature	oF	95
	Fuel Shading from the Sun	%	40
Terrain			
	Slope Steepness	%	20
	Ridge-to-Valley Elevation Difference	ft	100
	Ridge-to-Valley Horizontal Distance	mi	0.1
	Spotting Source Location		RT
Fire			
	Elapsed Time	h	0.1
Suppression			
	Suppression Tactic		Rear
	Line Construction Offset	ch	0
	Resource Line Production Rate	ch/h	41

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

Resource Arrival Time	h	0
Resource Duration	h	8

TL6 - Moderate Load Broadleaf Litter Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	13	ch/h
Fireline Intensity	111	Btu/ft/s
Flame Length	3.9	ft
Area	0	ac
Perimeter	3	ch
Forward Spread Distance	1.3	ch
Backing Spread Distance	0	ch
Contain Status	Contained	
Time from Report	0.2	h
Contained Area	0.2	ac
Fireline Constructed	8.3	ch
Spot Dist from a Wind Driven Surface Fire	0.1	mi
Scorch Height	14	ft
Probability of Ignition from a Firebrand	67	%

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

BehavePlus 5.0.5 (Build 307)

TL1 - Low Load Compact Conifer Litter

Tue, May 28, 2013 at 11:07:53

Inputs: SURFACE, SIZE, CONTAIN, SPOT, SCORCH, IGNITE

Input Variables		Units	Input Value(s)
Fuel/Vegetation, Surface/Understory			
	Fuel Model		TL1
Fuel/Vegetation, Overstory			
	Downwind Canopy Height	ft	80
Fuel Moisture			
	1-h Moisture	%	5
	10-h Moisture	%	6
	100-h Moisture	%	7
	Live Herbaceous Moisture	%	30
	Live Woody Moisture	%	50
Weather			
	20-ft Wind Speed (upslope)	mi/h	20
	Wind Adjustment Factor		0.4
	Air Temperature	oF	95
	Fuel Shading from the Sun	%	40
Terrain			
	Slope Steepness	%	20
	Ridge-to-Valley Elevation Difference	ft	100
	Ridge-to-Valley Horizontal Distance	mi	0.1
	Spotting Source Location		RT
Fire			
	Elapsed Time	h	0.1
Suppression			
	Suppression Tactic		Rear
	Line Construction Offset	ch	0
	Resource Line Production Rate	ch/h	41
	Resource Arrival Time	h	0

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

Resource Duration	h	8

TL1 - Low Load Compact Conifer Litter Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	1	ch/h
Fireline Intensity	2	Btu/ft/s
Flame Length	0.6	ft
Area	0	ac
Perimeter	0	ch
Forward Spread Distance	0.1	ch
Backing Spread Distance	0	ch
Contain Status	Contained	
Time from Report	0	h
Contained Area	0	ac
Fireline Constructed	0.3	ch
Spot Dist from a Wind Driven Surface Fire	0	mi
Scorch Height	0	ft
Probability of Ignition from a Firebrand	67	%

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

BehavePlus 5.0.5 (Build 307)

TU4 - Dwarf Conifer With Understory

Tue, May 28, 2013 at 11:08:20

Inputs: SURFACE, SIZE, CONTAIN, SPOT, SCORCH, IGNITE

Input Variables		Units	Input Value(s)
Fuel/Vegetation, Surface/Understory			
	Fuel Model		TU4
Fuel/Vegetation, Overstory			
	Downwind Canopy Height	ft	80
Fuel Moisture			
	1-h Moisture	%	5
	10-h Moisture	%	6
	100-h Moisture	%	7
	Live Herbaceous Moisture	%	30
	Live Woody Moisture	%	50
Weather			
	20-ft Wind Speed (upslope)	mi/h	20
	Wind Adjustment Factor		0.4
	Air Temperature	oF	95
	Fuel Shading from the Sun	%	40
Terrain			
	Slope Steepness	%	20
	Ridge-to-Valley Elevation Difference	ft	100
	Ridge-to-Valley Horizontal Distance	mi	0.1
	Spotting Source Location		RT
Fire			
	Elapsed Time	h	0.1
Suppression			
	Suppression Tactic		Rear
	Line Construction Offset	ch	0
	Resource Line Production Rate	ch/h	41

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

Resource Arrival Time	h	0
Resource Duration	h	8

TU4 - Dwarf Conifer With Understory Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	36.9	ch/h
Fireline Intensity	802	Btu/ft/s
Flame Length	9.8	ft
Area	0.4	ac
Perimeter	8	ch
Forward Spread Distance	3.7	ch
Backing Spread Distance	0.1	ch
Contain Status	Withdrawn	
Time from Report	8	h
Contained Area	-1	ac
Fireline Constructed	328	ch
Spot Dist from a Wind Driven Surface Fire	0.3	mi
Scorch Height	94	ft
Probability of Ignition from a Firebrand	67	%

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

BehavePlus 5.0.5 (Build 307)

GR6 - Moderate Load Humid Climate Grass

Tue, May 28, 2013 at 11:09:27

Inputs: SURFACE, SIZE, CONTAIN, SPOT, SCORCH, IGNITE

Input Variables		Units	Input Value(s)
Fuel/Vegetation, Surface/Understory			
	Fuel Model		GR6
Fuel/Vegetation, Overstory			
	Downwind Canopy Height	ft	80
Fuel Moisture			
	1-h Moisture	%	5
	10-h Moisture	%	6
	100-h Moisture	%	7
	Live Herbaceous Moisture	%	30
	Live Woody Moisture	%	50
Weather			
	20-ft Wind Speed (upslope)	mi/h	20
	Wind Adjustment Factor		0.4
	Air Temperature	oF	95
	Fuel Shading from the Sun	%	40
Terrain			
	Slope Steepness	%	20
	Ridge-to-Valley Elevation Difference	ft	100
	Ridge-to-Valley Horizontal Distance	mi	0.1
	Spotting Source Location		RT
Fire			
	Elapsed Time	h	0.1
Suppression			
	Suppression Tactic		Rear
	Line Construction Offset	ch	0
	Resource Line Production Rate	ch/h	41
	Resource Arrival Time	h	0

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

Resource Duration	h	8

GR6 - Moderate Load Humid Climate Grass Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	252	ch/h
Fireline Intensity	5478	Btu/ft/s
Flame Length	23.6	ft
Area	17.4	ac
Perimeter	58	ch
Forward Spread Distance	25.2	ch
Backing Spread Distance	0.7	ch
Contain Status	Withdrawn	
Time from Report	8	h
Contained Area	-1	ac
Fireline Constructed	327.7	ch
Spot Dist from a Wind Driven Surface Fire	0.6	mi
Scorch Height	416	ft
Probability of Ignition from a Firebrand	67	%

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

Appendix G: Adequate Holding Resources Worksheet

Project Name: STRI Prescribed Fire Plan Prepared By: Travis Neppl 9/11/13
Fuel Models Inside Project Area: TL1, TL6, TU3, GR6 Fuel Models Outside Project Area: TL6

Characteristics	Output type	Modeling Predictions Inside Project Area				Outside Project Area	Unit of Measure
CRITICAL FIRE INPUTS	Fuel Model	TL6	TL1	TU3	GR6	TL6	
	1 Hr Fuel Moisture	5	5	5	5	5	%
	Live Herbaceous	N/A	N/A	N/A	30	N/A	%
	Live Woody Moisture	N/A	N/A	50	N/A	N/A	%
	Mid Flame Wind Speed	8	8	8	8	8	MPH
	Slope	20	20	20	20	20	%
KEY FIRE BEHAVIOR OUTPUTS	Rate of Spread (ROS)	13	1	82	252	13	ch/hr
	Fireline Intensity	111	2	1464	5478	111	BTU/ft/sec
	Flame Length	3.9	0.6	13	24	3.9	Feet
	Probability of Ignition	67	67	67	67	67	%
	Spotting Distance	0.1	0.0	0.3	0.7	0.1	Miles
	Scorch Height	14	0.0	155	416	14	Feet
FIRE SIZE	Projection Time	0.1	N/A	N/A	N/A	0.1	Hours
	Forward Spread	1.3				1.3	Chains
	Backward Spread	0.1				0.1	Chains
FIRE CONTAINMENT	Method Of Attack	Rear	N/A	N/A	N/A	Rear	Head/Rear
	Contained Area	0.2				0.2	Acres
	Contained Perimeter	8.3				8.3	Chain
	Min. Line Building Rate Required*	41				28	Ch/hr
1. Choose greater total line building rate from inside and outside the project area		28					Ch/hr
2. Estimate potential number spot fires or slopovers at one time:						**1**	
3. TOTAL LINE BUILDING RATE NEEDED (multiply line 1 times line 2)						**28**	Ch/hr

* Fire modeling projections for containment of spot fires or slop overs in fuel models TL1, TU4, and GR6 were not included, as those fuels are not present continuously outside of the burn project boundaries.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

Production Rates: Ease of Access: POOR-FAIR-**GOOD**-EXCELLENT

On Site Organization	Total # Planned On Burn	Total # Dedicated to Prescribed Fire	Total # Available for Spot Fire or Slopover Control		Line Building Production Rates		Spot Fire or Slopover Line Building Capacity
Overhead	3	1 RXB2	2 (1 ICT5 overseeing suppression efforts, 1 FIRB building line)	**X**	8	Ch/hr	8
Firing Crew	1	0	1	**X**	8	Ch/hr	8
Holding Crew	0	0	0	**X**	8	Ch/hr	0
UTV w/ water	1	0	0	**X**	8	Ch/hr	0
Engine (Crew of 2)	1	0	2 (on foot)*	**X**	8	Ch/hr	16
3. TOTAL CAPACITY	6						32
4. TOTAL LINE BUILDING RATE NEEDED (from table above)							28
5. DETERMINATION OF ADEQUATE HOLDING RESOURCES (Line 4 minus Line 3)						Ch/hr	**+ 4**

* Some spot fires will not be accessible by Engine or UTV. Production Rates have been included for the Engine Crew on foot using hand tools. No production rates have been listed for the UTV operator in the event that it is operated by overhead who will not build line.

Project Name: Stones River National Battlefield FY14-18 Prescribed Fire Plan

Appendix G: Medical Plan

MEDICAL PLAN	1. Incident Name	2. Date Prepared	3. Time Prepared	4. Operational Period
	STRI Burn Units	1/3/2014		All

5. Incident Medical Aid Station

Medical Aid Stations	Location	Paramedics Yes	Paramedics No
First Aid	Personnel on scene		X

6. Transportation

A. Ambulance Services

Name	Address	Phone	Paramedics Yes	Paramedics No
Rutherford County EMS		911 615-898-7790	X	

B. Incident Air Ambulances

Name	Location	Paramedics Yes	Paramedics No
Vanderbilt Medical Center	Nashville, Tennessee LZ N35'52.707 W86'26.037 Tour Loop Road	X	

7. Hospitals

Name	Address	Travel Time Air	Travel Time Ground	Phone	Helipad Yes	Helipad No	Burn Center Yes	Burn Center No
Middle Tennessee Medical Center	1700 Medical Center Parkway Murfreesboro, TN		10	615-396-4100	X			X
Vanderbilt Medical & Trauma Center	1211 Medical Center Parkway	10	40	615-322-5000	X		X	

8. Medical Emergency Procedures

The closest and most qualified medical person on scene will provide first care to victim. All medical emergency evacuations will be coordinated by STRI Park Ranger. 911 Dispatch will then contact local area EMS for transportation to nearest medical facility.

Prepared by (Medical Unit Leader)	10. Reviewed by (Safety Officer)

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Appendix H: Test Fire Documentation

Treatment Unit: _____ Date: _____

Test Fire Results		
	Yes	**No**
Are all prescription parameters favorable for implementing the burn?		
Narrative Comments:		
Is the observed fire behavior within prescription?		
Narrative Comments:		
Is the test fire successful, will it meet the plan objectives?		
Narrative Comments:		
If three items above are all "Yes", proceed with the prescribed fire.		

Signatures	
Burn Boss / Date / Time	Firing Boss / Date / Time

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Appendix I: Required Notification List

To Be Contacted On the Morning of to the Burn		
Name of Contact	**Contact Info**	**Date/Time Contacted**
Gayle Hazelwood - STRI Superintendent	(615) 893-9501	
Gib Backlund – STRI Chief of Operations	(615) 893-9501	
Randy Anderson – STRI Integrated Resource Program Manager	(615) 893-9501	
TN Forestry Commission (burn permit) - Rutherford County	877-350-2876	
NWS Nashville (spot weather request)	615-754-8502	
Rutherford County Sheriff's Office	615-898-7770	
Rutherford County Ambulance	615-898-7790	
Rutherford County Fire Department - Station 1 - Station 2	 615-907-4086 615-895-5066	
Murfreesboro Fire Department	615-893-1422	
Murfreesboro Police Department	615-893-1311	
Murfreesboro Airport	615-848-3254	

Appendix J: Contact Information

The information below is provided for reference only, and does not represent the required notifications for burn days. Please see Appendix I for the list of required notifications.

Contact	Phone Number
Samuel Larry SERO NPS Fire Management Officer	404-562-3108 x653 office
Mike Ward SERO NPS Fuels Management Specialist	404-507-5641 office 404-909-1196 cell
Gayle Hazelwood STRI Superintendent	(615) 893-9501 office
Gib Backlund STRI Chief of Operations	(615) 893-9501 office
Troy Morris STRI Integrated Resources Program Manager	(615) 893-9501 office (615) 207-3221 cell
David Adams Biological Science Technician	(615) 893-9501 office (931) 335-0959 cell
Shawn Nagle NATR Fire Management Officer	(662) 680-4028 office (662) 231-4024 cell
Travis Neppl NATR Fuels Management Specialist	(662) 680-4029 office (662) 401-5288 cell
Jesse Burton NATR Fire Ecologist	(662) 840-7572 office (662) 401-5292 cell
Tennessee Interagency Coordination Center	423-476-9760